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(54) Method of Managing Obesity in Domestic Animals

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5,080,8/94

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Industrie Canada Industry Canada

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Canada

METHOD OF MANAGING OBESITY IN DOMESTIC ANIMALSAbstract of the Disclosure

A method of reducing and then maintaining the body weight of a domestic animal is disclosed wherein a standardized, repeatable semi-quantitative assessment of body composition is performed. The animal is weighed and an appropriate amount of animal food having a pre-determined amount of protein, fat, fiber and caloric content is calculated and fed to the animal to achieve a desired rate of weight loss. The animal is periodically reassessed and placed on a maintenance diet of food having a pre-determined amount of protein, calories, fat and fiber so as to maintain a sure end-point body weight.

WHAT IS CLAIMED IS:

1. A method of reducing the body weight of a domestic animal comprising the steps of:
 - performing a semi-quantitative assessment of body composition of such domestic animal;
 - weighing such domestic animal;
 - determining an appropriate amount of a food to feed such animal, said food having a predetermined fat, fiber and caloric content;
 - feeding such animal said pet food having a predetermined fat, fiber, and caloric content; and
 - reassessing said animal at a regular interval to determine such animal's response to said feeding.
2. The method of claim 1 wherein said step of performing a semi-quantitative assessment of body composition further comprises performing a multiple-point body condition score assessment of a dog.
3. The method of claim 2 wherein said multiple-point body condition score assessment further comprises the steps of:
 - determining if said animal is emaciated by observing such animal to determine that such animal's ribs, lumbar vertebrae, pelvic bones and bony prominences are evident and that there is no discernable body fat and an obvious loss of muscle mass;
 - determining if such animal is very thin by observing such animal to determine that such animal's ribs, lumbar vertebrae and

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pelvic bones are easily visible and determine that there is some evidence of other bony prominences and a minimal loss of muscle mass;

determining if such animal is thin by palpating such animal to determine that such animal's ribs are easily palpated and said ribs are visible with no palpable fat and that the tops of lumbar vertebrae are visible and pelvic bones are becoming prominent and that such animal has an obvious waist and abdominal tuck;

determining if such animal is underweight by palpating such animal's ribs to determine if such animal's ribs are easily palpable and have a minimal fat covering observing such animal to determine that such animal's waist is easily noted when viewed from above and that such animal has an evident abdominal tuck;

determining if such animal has ideal body weight by palpating such animal's ribs to determine that such animal's ribs are palpable without excess fat covering and observing such animal to determine that such animal has an observable waist behind said ribs when viewed from above and such animal's abdomen is tucked up when viewed from the side;

determining if such animal is overweight by palpating said animal's ribs and determining that such animal's ribs are palpable with slight excess of fat covering and observing such animal to determine that such animal's waist is discernable when viewed from above but is not prominent and that such animal has an abdominal tuck;

determining if such animal is heavy by palpating said animal's ribs to determine that such ribs are palpable with difficulty and such ribs have a heavy fat cover and observing such animal for noticeable fat deposits over the lumber area and base of the tail and observing such animal to determine that such animal's waist is absent or barely visible and such animal's abdominal tuck is absent;

determining if such animal is obese by palpating such animal's ribs to determine that said ribs are not palpable under a very heavy fat cover or palpable only with significant pressure, and observing that such animal has heavy fat deposits over lumber area and base of the tail and such animal's waist is absent and no abdominal tuck and such animal has obvious abdominal distention;

determining if such animal is morbidly obese by observing such animal and determining that such animal has massive fat deposits over the thorax, spine, and base of the tail, and that in such animal the waist and abdominal tuck are absent and such animal has fat deposits on the neck and limbs and has obvious abdominal distention.

4. The method of claim 1 wherein said step of performing a semi-quantitative assessment of body composition further comprises performing a multiple-point body condition score assessment on a cat.

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5. The method of claim 4 wherein said multiple-point body condition score assessment further comprises the steps of:

determining if such animal is thin by observing such animal to determine that said ribs are visible on a short-haired animal, palpating said animal to determine there is no palpable fat, observing a severe abdominal tuck, and palpating such animal to determine that lumbar vertebrae and wing of ilia are easily palpated;

determining if such animal is underweight by palpating such animal's ribs and determining that such ribs are easily palpable with minimal fat covering, observing said animal to determine that lumbar vertebrae are obvious, that the animal has an obvious waist behind its ribs, and that there is minimal abdominal fat;

determining if such animal has ideal body weight by observing such animal and determining that such animal is well proportioned and that such animal has a waist behind its ribs, palpating such animal's ribs to determine that said ribs are palpable with slight fat covering, and observing that such animal has minimal abdominal fat pad;

determining if such animal is overweight by palpating such animal's ribs to determine that such ribs are not easily palpated and have a moderate fat covering, observing such animal to determine that said animal's waist is poorly discernible, that said animal has an obvious rounding of the abdomen, and that said animal has moderate abdominal fat pad; or

determining if such animal is obese by palpating such animal's ribs and determining that said ribs are not palpable under heavy fat covering, observing such animal to determine that such animal has heavy fat deposits over the lumbar area, face and limbs and that such animal has distention of the abdomen with no waist and such animal has extensive abdominal fat deposits.

6. The method of claim 1 wherein said step of reassessing said animal's response to said feeding further includes the step of determining said animal's body weight and performing said semi-qualitative assessment at periodic intervals.

7. The method of claim 1 wherein said step determining an appropriate amount of food having a predetermined fat, fiber, and caloric content to feed such animal further comprises the step of determining an appropriate caloric allowance based on an average energy need compared with said animal's weight.

8. The method of claim 1 wherein said step of determining an appropriate caloric allowance based on an average energy need compared with said animal's weight further includes the step of determining appropriate caloric allowance that will result in a weight loss of approximately 2% per week.

9. The method of claim 1 wherein the step of feeding such animal a pet food having a predetermined protein, fat, fiber, and caloric content further comprises feeding such animal a pet food comprising:

15% to 36% protein

5% to 16% fat;

12% to 20% fiber; and

2500 to 2700 kcal/kg (dry weight).

10. The method of claim 1 wherein the step of feeding such animal a pet food having a predetermined protein, fat, fiber and caloric content further comprises feeding a dog a pet food comprising:

21% to 25% protein;

5% to 8% fat;

14% to 19% crude fiber; and

2500 Kcal to 2700 kcal/kg (dry weight).

11. The method of claim 1 wherein the step of feeding such animal a pet food having a predetermined protein, fat, fiber and caloric content further comprises feeding a cat a pet food comprising:

33% to 38% protein;

6% to 9% fat;

10% to 14% crude fiber; and

2600 to 2900 kcal/kg (dry weight).

12. The method of claim 1 further comprising the step of determining such animal's maintenance energy requirements and determining a proper amount of a food to provide said maintenance energy requirements.

13. A method of performing a multiple-point body condition score assessment on a dog comprising the steps of:

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determining if such dog is emaciated by observing such dog to determine that such dog's ribs, lumbar vertebrae, pelvic bones and bony prominences are evidence and that there is no discernable body fat and an obvious loss of muscle mass;

determining if such dog is very thin by observing such animal to determine that such animal's ribs, lumbar vertebrae and pelvic bones are easily visible and that there is some evidence of other bony prominences and there is a minimal loss of muscle mass;

determining if such dog is thin by palpating such dog to determine that such dog's ribs are easily palpated and said ribs are visible with no palpable fat and that the tops of lumbar vertebrae are visible and pelvic bones are becoming prominent and that such dog has an obvious waist and abdominal tuck;

determining if such dog is underweight by palpating such dog's ribs to determine that such dog's ribs are easily palpable and have a minimal fat covering and observing said dog to determine that such dog's waist is easily noted when viewed from above and that such dog has an evident abdominal tuck;

determining if such dog has ideal body weight by palpating such dog's ribs to determine that such dog's ribs are palpable without excess fat covering and observing such dog to determine that such dog has an observable waist behind said ribs when viewed from above and such dog's abdomen is tucked up when viewed from the side;

determining if such dog is overweight by palpating said dog's ribs and determining if such dog's ribs are palpable with slight excess of fat covering and observing such dog to determine that such dog's waist is discernable when viewed from above but is not prominent and such dog has an abdominal tuck;

determining if such dog is heavy by palpating said dog's ribs and determining that such ribs are palpable with difficulty and such ribs have a heavy fat cover and observing such dog for noticeable fat deposits over the lumber area and base of the tail and observing such animal to determine that such dog's waist is absorbent or barely visible and such dog's abdominal tuck is absent;

determining if such dog is obese by palpating such dog's ribs to determine that said ribs are not palpable under a very heavy fat cover or palpable only with significant pressure and observing that such dog has heavy fat deposits over lumber area and base of the tail and such dog's waist is absent and no abdominal tuck and such dog has obvious abdominal distention; and

determining if such dog is morbidly obese by observing such dog and determining that such dog has massive fat deposits over the thorax, spine, and base of the tail, and in such dog the waist and abdominal tuck are absent and such dog has fat deposits on the neck and limbs and has obvious abdominal distention.

14. A method of performing a multiple-point body condition score assessment on a cat comprising the steps of:

determining if such cat is thin by observing a cat wherein said ribs are visible on a short-haired cat, palpating said cat to determine there is no palpable fat, observing a severe abdominal tuck, and palpating such cat to determine that lumbar vertebrae and wing of ilia are easily palpated;

determining if such cat is underweight by palpating such cat's ribs and determining that such ribs are easily palpable with minimal fat covering, observing said cat to determine that lumbar vertebrae are obvious, that the cat has an obvious waist behind its ribs, and that there is minimal abdominal fat;

determining if such cat has ideal body weight by observing such cat and determining that such cat is well proportioned and that such cat has a waist behind its ribs, palpating such cat's ribs to determine that said ribs are palpable with slight fat covering, and observing that such cat has minimal abdominal fat pad;

determining if said cat is overweight by palpating such cat's ribs to determine that such ribs are not easily palpated and have a moderate fat covering, observing such cat to determine that said animal's waist is poorly discernible, that said animal has an obvious rounding of the abdomen, and that said cat has moderate abdominal fat pad; and

determining if such cat is obese by palpating such cat's ribs and determining that said ribs are not palpable under heavy fat covering, that such cat has heavy fat deposits over the lumbar

area, face and limbs and that such cat has distention of the abdomen with no waist and such cat has extensive abdominal fat deposits.

15. A method of reducing and then maintaining the body weight of a domestic animal comprising the steps of:

- performing a semi-quantitative assessment of body composition of such domestic animal;

- weighing such domestic animal;

- determining an appropriate amount of snack food to feed such animal, said food having a predetermined caloric content;

- determining an appropriate amount of food to feed such animal;

- feeding such animal said pet food having a predetermined protein, fat, fiber and caloric content;

- feeding such animal said snack food;

- reassessing said animal at a regular interval to determine such animal's response to said feeding;

- determining when such animal has reached a predetermined maintenance weight;

- determining an appropriate amount of food to feed such animal so as to maintain said predetermined maintenance weight, said food having a predetermined protein, fat, fiber and caloric content;

- determining an appropriate amount of snack food to feed such animal to maintain said predetermined maintenance weight; and

- reassessing said animal at a regular interval to determine such animal's response to said maintenance feedings.

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M. HOD OF MANAGING OBESITY IN DOMESTIC ANIMALS

Background of the Invention

This invention generally provides a method of weight control for domestic animals, more specifically, a method of controlling body fat and obesity in domestic dogs or cats.

Obesity is the most common nutritional disorder of domestic animals such as cats and dogs. Although both cats and dogs suffer from obesity and the method disclosed in this invention is applicable to both cats and dogs, in the interest of brevity and clarity, generally the discussion will center on the use of the method in domestic dogs.

It is estimated that 25% - 44% of pet dogs are obese. Obesity is defined as an excessive accumulation of body fat due to the intake of more dietary energy, i.e., calories, than the body needs. An animal may be considered obese if it weighs more than 15% to 20% more than its ideal body weight or if it is determined to exceed "ideal" on an objective body condition index.

Obesity is often associated with an increased risk of adverse effects on health and longevity. Obesity can increase the risks associated with many health conditions including heart conditions, respiratory problems, endocrine imbalances, and musculo-skeletal disorders.

Obesity increases the work load on the heart which can aggravate cardiovascular problems. Obese dogs may have shortness of breath, or easily become fatigued, and have difficulty

br athing after exercise. Obesity is often associated with diabetes mellitus. Obesity increases th strain on joints such as the hips and may lead to or aggravate joint problems. Furthermore, severely obese dogs are also more prone to heat stress, gastrointestinal disorders, liver disease, skin conditions, infectious diseases and reproductive problems.

Individual animals vary greatly in the amount of food they require to maintain their body weight. Dogs which are often inactive spend less energy and require fewer calories and some dogs consume too much food if they are offered an unlimited or excessive amount of any diet. In addition, most table scraps and treats are high in calories and can cause weight gain. Some breeds of dogs, such as labrador retrievers, beagles, cocker spaniels and dachshunds appear to be at more risk for obesity which suggests a genetic factor.

Often pets are determined to be overweight by the pet owner or by a veterinarian simply by a subjective analysis or viewing of the pet's overall physical appearance. The dog is considered "overweight" or "fat" or "obese" but no objective, quantitative analysis of the animal's physical condition is done. The pet may be weighed, but that procedure does not give an accurate determination of the relationship of the animal's fat to its lean body mass. Furthermore, this type of determination lacks standardization, accuracy and repeatability between assessments.

Often the pet's ideal body condition and ideal body fat content are misjudged. The owner or veterinarian attempts to control the animal's weight by placing the dog on a caloric restricted diet by offering or providing less food. This type of dieting can be harmful because the restricted diet can deprive the animal of needed protein, and other nutrients as well as calories. Furthermore, this method does not provide for a managed weight reduction. The animal may lose weight either too quickly or too slowly, either of which can be harmful to the pet's health. Moreover, no repeatable, objective body condition assessment is performed. There is no rational end-point to a caloric restricted diet. The animal may loose too much weight or not enough.

Summary of the Invention

It is therefore an object of the present invention to provide a method of managed weight loss for a domestic animal.

Another object of the present invention is to provide a method of weight loss that includes a repeatable, objective body condition assessment with which to assess the animal's weight loss requirements.

Yet another object of the present invention is to provide a method that employs use of an animal food having a predetermined caloric, protein, fat, and fiber content.

Still another object of the present invention is to provide a method that provides for a predetermined rate of weight

loss and a method of maintaining a predetermined target end weight.

Briefly stated, a method of reducing the body weight of a domestic animal is provided which includes the steps of performing semi-quantitative assessment of body composition of the domestic animal as well as weighing the domestic animal, determining an appropriate amount of food to feed such animal with the food having a predetermined fat, fiber, protein and caloric content. The method provides for feeding the animal the pet food having the predetermined fat, protein, fiber and caloric content for a given period of time and then reassessing the animal at regular intervals to determine the animal's response to the feeding. Once the animal reaches a targeted end-point or maintenance weight, a determination of an appropriate amount of food having a predetermined amount of fat, protein, fiber and caloric content is made and the animal is maintained on that amount of food subject to periodic reassessments.

Description of the Drawings

Fig. 1 is a diagram illustrating the method of the present invention;

Fig. 2 is a flow chart illustrating the primary steps of the preferred embodiment of the method of this invention in which a computer is used to aid in determining the amount of food to be fed to a specific animal; and

Figs. 3A-3C is a listing of a computer program for carrying out step 3 of the method of this invention described in Fig. 1.

Description of the Preferred Embodiment

The method provides for the determination of a diet recommendation for each domestic animal based on its body condition score, body weight and average caloric requirements. The program generally targets the weight loss of 2% of body weight per week but can be changed for the individual animal.

The method of the present invention is shown diagrammatically in Fig. 1. Preferably an animal is taken to a veterinarian and the veterinarian performs a semi-quantitative assessment of body composition of the animal, as shown in block 1 of Fig. 1. The veterinarian uses a nine-point body condition score for dogs that has been developed that allows a semi-quantitative assessment of the body composition (excess fat) which serves to help the veterinarian, handler or pet owner to identify obesity and monitor changes more accurately and it allows an estimate of ideal body weight which can be used in the weight management method. To measure the effects of the method on obesity, it is necessary to objectively measure obesity. To that end, the present invention includes (but is not necessarily limited to) a nine-point body condition score (BCS) system for dogs and a five-point body condition score (BCS) system for cats.

DOGS

To determine repeatability, dogs were evaluated on two separate occasions by six different people. The data were

analyzed for variation within scorer or in between scorers. Subsequently the BCS was used to evaluate thirty-nine overweight dogs before and after a weight loss program. Correlations were evaluated between body weight and percent over estimated ideal body weight. Body condition scores on the preliminary trial ranged from 2 - 8. Repeatability of scores within scorers was always within one scoring unit. Scores between judges was always within two scoring units. Body condition scores were significantly correlated with body weight for large breed females only; however, BCS was highly significantly correlated with percentage overweight for male and female large breed dogs as well as male schnauzers ($R=.79-.97$; $p < 0.001$). Each change in BCS is associated with approximately 11.5% change in body weight. This varies by breed, being a larger percentage in smaller dogs.

The inventors found that the repeatability of this method was adequate for assessing changes in body condition. However, it is recommended that the same person perform evaluations throughout any tests.

BODY CONDITION SCORES TABLE I (DOGS)

BCS	DESCRIPTION
1 EMACIATED	Ribs, lumbar vertebrae, pelvic bones and all bony prominences evident from a distance. No discernable body fat. Obvious loss of muscle mass.
2 VERY THIN	Ribs, lumbar vertebrae and pelvic bones easily visible. No palpable fat. Some evidence of other bony prominence. Minimal loss of muscle mass.

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- 3 THIN Ribs easily palpated and may be visible with no palpable fat. Tops of lumbar vertebrae visible. Pelvic bones becoming prominent. Obvious waist and abdominal tuck.
- 4 UNDERWEIGHT Ribs easily palpable, with minimal fat covering. Waist easily noted, viewed from above. Abdominal tuck evident.
- 10 5 IDEAL Ribs palpable without excess fat covering. Waist observed behind ribs when viewed from above. Abdomen tucked up when viewed from side.
- 6 OVERWEIGHT Ribs palpable with slight excess of fat covering. Waist is discernable viewed from above but is not prominent. Abdominal tuck apparent.
- 20 7 HEAVY Ribs palpable with difficulty, heavy fat cover. Noticeable fat deposits over lumbar area and base of tail. Waist absent or barely visible. Abdominal tuck may be absent.
- 8 OBSE Ribs not palpable under very heavy fat cover, or palpable only with significant pressure. Heavy fat deposits over lumbar area and base of tail. Waist absent. No abdominal tuck. Obvious abdominal distention may be present.
- 30 9 MORBID Massive fat deposits over thorax, spine and base of tail. Waist and abdominal tuck absent. Fat deposits on neck and limbs. Obvious abdominal distention.

CATS

A five-point body condition score (BCS) system for cats was developed. Seventy-seven cats of various weights and both sexes were evaluated for BCS, body weight (BW) and zoometric measurements including body length (L), cranial thoracic circumference (CTC), pelvic circumference (PC, right foreleg

length (RF) and right hind leg length (RH). Fat mass (RM) and percentage of body fat (%BF) were calculated according to the methods disclosed in Stanton et al. Bioelectrical Impedance And Zoometry For Body Composition Analysis In Domestic Cats, American Journal of Veterinary Research, No. 2, February 1992, the disclosure of which is hereby incorporated by reference.

Approximately six weeks later, twelve male and twelve female cats were re-evaluated for BCS and body weight (BW) to determine repeatability. Cats were scored to the nearest 1/2. The
 10 five-point BCS correlations are greater for females than males yet even in males BCS correlated well with fat mass (FM) and weight (W), and the ratio of body length to weight (L^2/W). ($R = .85, .84, -.79$, respectively; $P < 0.0001$). For combined sexes and for females, the correlations between BCS and L^2/W , circumference and fat mass were at least $R = .90$ or greater, $P < 0.0001$. The variability in BCS for cats reevaluated was less than 0.5 points, with males less variable than females.

The zoometrics measure of PC and L^2/W accounted for most of the differences in FM and percent BF, respectively based
 20 on carcass analysis disclosed in Stanton and incorporated herein by reference. These parameters were highly correlated with BCS ($R = .92, .90$, respectively; $P < 0.0001$) estimated fat mass was also highly correlated with BCS ($R = 0.91$; $P < 0.0001$), demonstrating the validity of this five-point BCS system for estimated body composition in cats.

BODY CONDITION SCORES TABLE I (CATS)

BCS		DESCRIPTION
1	THIN	Ribs visible on shorthaired cats; n palpable fat; severe abdominal tuck; lumbar vertebrae and wing of ilia easily palpated.
2	UNDERWEIGHT	Ribs easily palpable with minimal fat covering; lumbar vertebrae obvious; obvious waist behind ribs; minimal abdominal fat.
3	IDEAL	Well proportioned; observe waist behind ribs; ribs palpable with slight fat covering; abdominal fat pad minimal.
4	OVERWEIGHT	Ribs not easily palpated with moderate fat covering; waist poorly discernable; obvious rounding of abdomen; moderate abdominal fat pad.
5	OBESSE	Ribs not palpable under heavy fat cover; heavy fat deposits over lumbar area, face and limbs; distention of abdomen with no waist; extensive abdominal fat deposits.

Next, the present invention involves weighing the animal and recording the animal's weight in kilograms, as shown in block 2 of Fig. 1. As shown in block 3 of Fig. 1, the next step requires determining an appropriate amount of food to feed the animal, the food having a pre-determined amount of protein, fat, fiber and caloric content. Preferably, this third step of determining the appropriate amount of food to feed the animal can be performed electronically by a personal computer. For example, software, as described in Fig. 3, has been developed to calculate the appropriate amount of a specific food to give an animal to allow a predetermined amount of weight loss.

10 In the initial visit, the animal's body weight is determined by step 2, is entered into a computer and a determination of the appropriate caloric allowance for that animal based on an average energy need is made. As will be explained below, the animal can be reassessed, and on reassessment, the animal's weight is again entered and the computer adjusts food quantities based on that individual animal's response to previous regimen. Furthermore, as will be described below, the animal can be placed on a maintenance feeding to maintain a predetermined target weight through appropriate feeding. The software program can determine the appropriate amount of food to feed for maintenance of weight loss. By a simple adjustment to the rate of weight loss (to zero), the computer can calculate the pet's maintenance energy needs and correct amount of feed.

20 The next step, as shown in block 4 of Fig. 1, involves the feeding of the animal the pre-determined amount of pet food having a pre-determined fat, caloric, fiber and protein content. It has been determined that the optimum constituent contents for the preferred pet food for use with the present method would be in the general ranges of protein, 15% to 36%; fat, 5% to 16%; crude fiber, 2% to 20%; calories, 2200 to 2700 kilocalories (kcal) per kilogram (kg) (based on dry matter of food). A specific formula shown to be effective with the present method for feeding to dogs would contain: protein, 21% to 25%; fat, 5% to 8%, crude fiber, 14% to 19%; and calories, 2500 to 2700

kcal/kg (dry weight). This preferred dog food is formulated to provide proper nutrition as part of the managed weight loss program, having an adequate supply of nutrients but a reduced number of calories, reduced quantities of fat and increased level of fiber. One such preferred dog food is commercially available from the Ralston Purina Company of St. Louis, Missouri under the brand CNM Clinical Nutrition Management OM-Formula. The animal is fed the appropriate amount of dog food for a predetermined interval, generally one month. Similarly, the preferred cat food for use with the present method would contain protein 33% to 38%; fat 6% to 9%; crude fiber 10% to 14% and calories 2600 to 2900 Kkals. per kg of food, dry weight.

It should be noted that the third step of determining the appropriate amount of food to feed such animal can also include the step of determining the amount of predetermined of pet food having a predetermined fat, caloric, fiber and protein content, as well as supplementation with the pet's favorite snack. This determination can take into account the nutrient and caloric content of various snacks including dog biscuits, dog treats, or any other acceptable form of dog treat. The total amount of calories derived from the dog food is reduced by a specific percentage to allow for the number of calories added to the diet by such treats.

As shown in block 5, the program is effective once the animal has reached a predetermined target end point, or maintenance weight, a determination of the amount of the aforestated dog food and/or treats can be repeated to provide the animal with sufficient caloric intake so as to maintain the targeted end weight (as shown in block 6). The animal can be reassessed at regular intervals to determine if the maintenance program is effective.

10

As shown in Fig. 2, a flow chart illustrating the major steps of the method of the present invention is disclosed. It will be understood that in Fig. 2 "CNM OM" and "ProPlan" are trademarks for pet food commercially available from the assignee of the present invention, Ralston Purina Company of St. Louis, Missouri.

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It will be recognized by those skilled in the art that there are variations on the aforestated can be made without departing from the scope of the invention. Therefore, the specification, the drawing and the description of the preferred embodiment can be viewed as illustrative and not in a limiting sense.

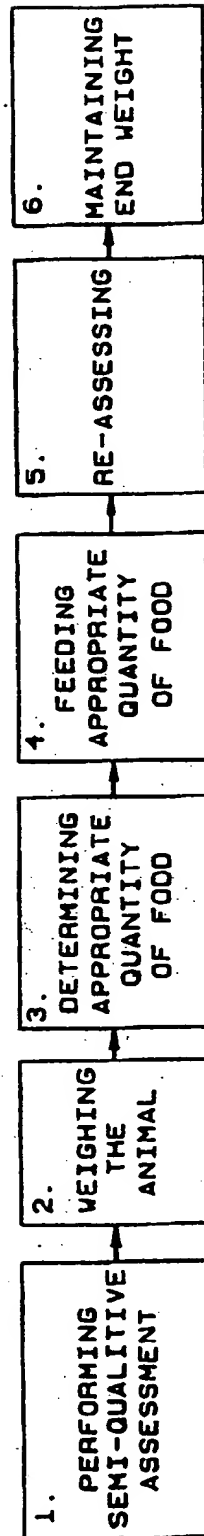


FIG. 1

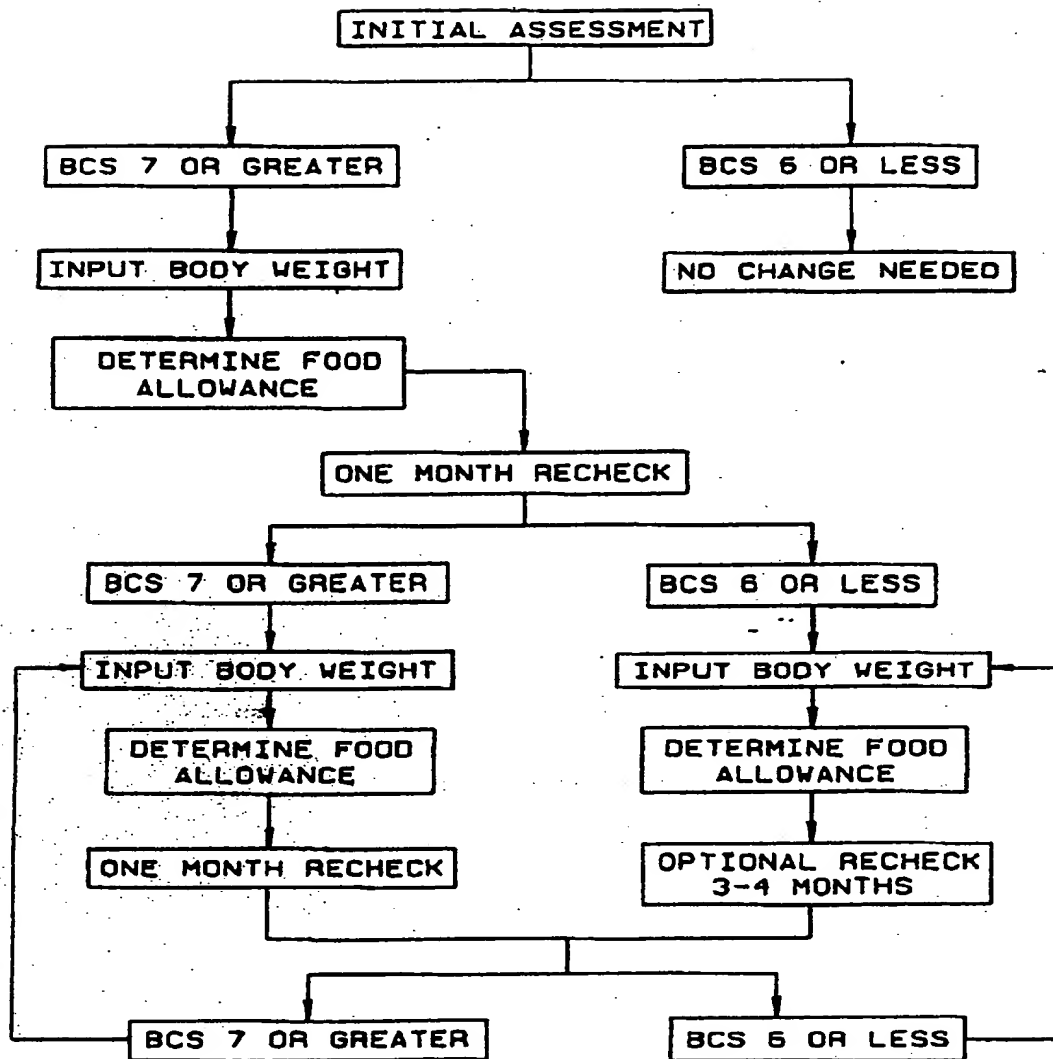


FIG. 2

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MEMBER(DIET)
CALC_DIET PROCEDURE.

(THIS PROCEDURE IS NOT DEFINED)

TREAT_KCAL SHORT
PRI_DATE STRING(@D1)

CODE

IF MEM:ACTION = T INITIAL VISIT DIET CALCULATION

THEN
MEM:MER = 132 * (PAT:PV_WT / 2.2) ^ .75
END IF

IF MEM:ACTION = R RECHECK VISIT DIET CALCULATION

THEN
MEM:DAY = PAT:PV_DATE - MEM:PREV_DATE
MEM:CFI = MEM:DAY * (PAT:PV_KCAL + MEM:XTRA_KCAL)
MEM:MER = (MEM:CFI - 3600 * (PAT:PV_WT - MEM:PREV_WT)) / MEM:DAY
MEM:WT_CHG = PAT:PV_WT - MEM:PREV_WT
END IF

MEM:TWL = PAT:PV_WT * PAT:WT_LOSS / 100
MEM:DCA = MEM:TWL * 3600 / 7
MEM:DCA = MEM:MER - MEM:DCA
MEM:FOR_NAME = CLIP(PAT:F_NAME) & ' ' & PAT:L_NAME
IF MEM:DCA <= 0
THEN
DO ALERT
ELSE
DO DIET
END IF
RETURN

IRETURN TO CALLER

ALERT ROUTINE

CLEAR(MEM:DIET_REC1)
CLEAR(MEM:DIET_REC2)
CLEAR(MEM:DIET_REC3)

123456789012345678901234567890123456789012345678901234567890123

MEM:DIET_REC1 = 'The data on the Patient Update Screen is not consistent with a valid diet'
MEM:DIET_REC2 = 'recommendation. Examine this dog's eating habits for other sources of'
MEM:DIET_REC3 = 'calories or lower the % weight loss per week.'
DIET_ALERT ! CALL FORM TO DISPLAY RECOMMENDED DIET

DIET ROUTINE

MEM:CUPS = ROUND(8 * (DCA / DIE:KCAL_CUP), 1) / 8
PART_CUP
CLEAR(MEM:DIET_REC1)
CLEAR(MEM:DIET_REC2)
CLEAR(MEM:DIET_REC3)
CLEAR(MEM:DIET_REC4)
CLEAR(MEM:DIET_REC5)
CLEAR(MEM:DIET_REC6)
CLEAR(MEM:RECHECK_1)

FIG. 3A

Fealayan & Singlerhurst
PATENT AGENTS

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CLEAR(MEM:RECHECK_2)
CLEAR(MEM:RECHECK_3)
MEM:DIET_REC1 = 'Recommended daily intake is ' & CLIP(LEFT(MEM:DCA)) & ' Kcal'
IF MEM:ACTION = T
  PRT_DATE = MEM:PREV_DATE
  MEM:RECHECK_1 = 'Since the last visit ' & CLIP(LEFT(PRT_DATE)) & ', your pet has'
  IF MEM:WT_CHG > 0
    MEM:RECHECK_1 = CLIP(MEM:RECHECK_1) & ' gained'
  ELSE
    MEM:RECHECK_1 = CLIP(MEM:RECHECK_1) & ' lost'
  .END IF
  MEM:RECHECK_1 = CLIP(MEM:RECHECK_1) & ' ' & CLIP(LEFT(ABS(MEM:WT_CHG))) & '
  lbs. Based on this'
  MEM:RECHECK_2 = 'result and your pet's current diet profile, the new recommendation is'
  MEM:RECHECK_3 = CLIP(LEFT(MEM:DCA)) & ' Kcal/day'
  .END IF
  IF PAT:TREATS = N
    MEM:DIET_REC1 = 'or ' & CLIP(LEFT(MEM:CUPS_WHOLE)) & CLIP(MEM:CUP_FRACTION) |
      & ' cups of ' & CLIP(DIE:NAME) & ' per day.'
    MEM:RECHECK_3 = CLIP(MEM:RECHECK_3) & ' or ' & CLIP(LEFT(MEM:CUPS_WHOLE)) &
      CLIP(MEM:CUP_FRACTION) |
      & ' cups of ' & CLIP(DIE:NAME) & ' per day.'
  ELSE
    TREAT_KCAL = ROUND(DCA * 1.1)
    MEM:DIET_REC4 = 'If snacks or treats are totally eliminated from the diet the recommended'
    MEM:DIET_REC5 = 'daily intake is ' & CLIP(LEFT(MEM:CUPS_WHOLE)) &
      CLIP(MEM:CUP_FRACTION) |
      & ' cups of ' & CLIP(DIE:NAME) & '
    MEM:CUPS = ROUND((DCA * .9) / DIE:KCAL_CUP, 1) / 8
    PART_CUP
    MEM:DIET_REC1 = CLIP(MEM:DIET_REC1) & '
    MEM:RECHECK_3 = CLIP(MEM:RECHECK_3) & '
    MEM:DIET_REC1 = 'This includes ' & CLIP(LEFT(MEM:CUPS_WHOLE)) &
      CLIP(MEM:CUP_FRACTION) |
      & ' cups of ' & CLIP(DIE:NAME) & ' per day plus '
    MEM:DIET_REC3 = LEFT(CLIP(TREAT_KCAL)) & ' Kcal/day in snacks or treats.'
  .END IF
  IF MEM:ACTION = T
    1 2 3 4 5 6 7
    1
    01234567890123456789012345678901234567890123456789012345678901234567890123
    MEM:DIET_REC6 = 'Based on average caloric needs, and your dog's current body weight, this'
    MEM:DIET_REC7 = 'diet may result in a weight loss of ' & LEFT(CLIP(MEM:TWL)) & ' pounds per
    week.'
  ELSE
    MEM:DIET_REC6 = 'Based on your dog's estimated energy requirements and current body weight'
    MEM:DIET_REC7 = 'this diet may result in a weight loss of ' & LEFT(CLIP(MEM:TWL)) & ' pounds
    per week.'
  .END IF
  MEM:PRT_WEEK = 1
  LOOP 5 TIMES
    MEM:PRT_DATE[MEM:PRT_WEEK] = PAT:PV_DATE + (7 * (MEM:PRT_WEEK - 1))
    MEM:PRT_WT[MEM:PRT_WEEK] = PAT:PV_WT - (MEM:PRT_WEEK - 1) * MEM:TWL
    MEM:PRT_WEEK = MEM:PRT_WEEK + 1

```

FIG. 3B

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.IEND_LOOP

MEM:REC_HLP = 'DISTREC'

IF MEM:DCA < .25 * MEMMER

IF MEM:ACTION = 'T'

MEM:REC_HLP = 'WARNING'

ELSE

MEM:REC_HLP = 'WARNING'

.IEND_IF

.IEND_IF

DIET_DISP | CALL FORM TO DISPLAY RECOMMENDED DIET

PART_CUP PROCEDURE

(THIS PROCEDURE IS NOT DEFINED)

CODE

PART_CUP ROUTINE

MEM:CUPS_WHOLE = INT(MEM:CUPS)

CASE (MEM:CUPS - MEM:CUPS_WHOLE)

OF .125

MEM:CUP_FRACTION = '1/8'

| 1/4 CUP

OF .25

MEM:CUP_FRACTION = '1/4'

| 1/4 CUP

OF .375

MEM:CUP_FRACTION = '3/8'

| 1/4 CUP

OF .50

MEM:CUP_FRACTION = '1/2'

| 1/2 CUP

OF .625

MEM:CUP_FRACTION = '5/8'

| 3/4 CUP

OF .75

MEM:CUP_FRACTION = '3/4'

| 1/2 CUP

OF .875

MEM:CUP_FRACTION = '7/8'

| 3/4 CUP

ELSE

MEM:CUP_FRACTION = ''

| WHOLE CUP

.IEND_CASE

RETURN

FIG. 3C

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